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Ionospheric Data Report — Jul 1965

IONOSPHERIC DATA: BANGKOK, THAILAND

Compiled by: VICHAI T. NIMIT

Prepared for:

U.S. ARMY ELECTRONICS LABORATORIES
FORT MONMOUTH, NEW JERSEY

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SPONSORED BY THE ADVANCED RESEARCH PROJECTS AGENCY
FOR THE
THAI-U.S. MILITARY RESEARCH AND DEVELOPMENT CENTER
SUPREME COMMAND HEADQUARTERS
BANGKOK, THAILAND

STANFORD RESEARCH INSTITUTE

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BANGKOK, THAILAND

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ILLUSTRATIONS

I INTRODUCTION

Ionospheric observations are being carried out at the Laboratory of the Military Research and Development Center at Bangkok, Thailand, a joint United States-Thailand organization. A Model C-2 vertical-incidence sounder supplied and operated by the United States Army Radio Propagation Agency has been installed there. Table I gives pertinent information about the site.

Table I

VERTICAL-INCIDENCE SOUNDER SITE
AT BANGKOK, THAILAND

Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
13.73°N	100.57°E	2.5°N	169.83°E

Dip angle: 10°N

Distance from dip equator: 450 km

Equipment:

Instrument: Type C2 (automatic)

PRF: 60 pps

Frequency sweep time: 30 sec

Frequency sweep range: 1 to 25 Mc

Pulse duration: 50 μsec

Peak pulse power: approximately 10 kw.

The cooperation and participation of staff members of the Thailand Ministry of Defense and the support of the United States Advanced Research

Projects Agency, the United States Army Electronics Laboratories, and the United States Army Radio Propagation Agency made it possible for the data presented in this report to be accumulated.

II TERMINOLOGY AND SYMBOLS

The terminology and symbols used in this data report are in accordance with the conventions established by the World Wide Soundings Committee.[1]

A. TERMINOLOGY

f_oF_2 f_oF_1 f_oE	The ordinary wave critical frequency for the F_2 and F_1 layers and the E region, respectively.
f_oE_s	The ordinary wave top frequency corresponding to the highest frequency at which a mainly continuous E_s trace is observed.
f_bE_s	The blanketing frequency of an E_s layer, i.e., the lowest ordinary wave frequency at which the E_s layer begins to become transparent. (This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.)
f_{min}	The frequency below which no echoes are observed.
M(3000)F_2	The maximum usable frequency factor for a path of 3000 km for transmission by the F_2 layer.
h'F_2	The minimum virtual height of the ordinary wave trace for the highest stable stratification in the F region.
h'F	The most significant F-region virtual height parameter, that for the lowest F-region stratification. (Thus h'F is identical with the current h'F_2 when F-region stratification is absent, i.e., at night, and with current h'F_1 when F_1 stratification is present.)

[1]W. R. Piggott and K. Rawer, URSI Handbook of Ionogram Interpretation and Reduction of the World Wide Sounding Committee (Elsevier Publishing Company, Amsterdam, London, New York, 1961).

B. DESCRIPTIVE LETTERS

Certain effects observed on ionograms may make it difficult or impossible to obtain accurate numerical values. The descriptive letters listed below, when used alone indicate, in general, the presence of a phenomenon that may have influenced the measurement. Qualifying letters (Sec. C) indicate the nature of the uncertainty.

- A A lower thin layer present, e.g., E_s
- B Absorption in the vicinity of f_{min}
- C Any non-ionospheric reason
- D The upper limit of the normal frequency range
- E The lower limit of the normal frequency range
- F Spread echoes present
- G Ionization density of the layer too small for measurement
- H Stratification present
- L No sufficiently definite cusp between layers of the trace
- M Ordinary and extraordinary components indistinguishable
- N Conditions such that the measurement cannot be interpreted
- O Measurement referring to the ordinary component
- R Attenuation in the vicinity of a critical frequency
- S Interference or atmospherics
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful
- V Forked trace
- W Echo lying outside the height range recorded
- X Measurement referring to the extraordinary component
- Y Intermittent trace
- Z Third magneto-ionic component present.

C. QUALIFYING LETTERS

- D Greater than. . .
- E Less than. . .

I An interpolated value

J Ordinary component characteristic deduced from the extraordinary component

O Extraordinary component characteristic deduced from the ordinary component

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful

U Uncertain numerical value

Z Measurement deduced from the third magneto-ionic component.

D. DESCRIPTION OF STANDARD TYPES OF E_s

The eight standard types of E_s are identified by lower-case letters: f, l, c, h, q, r, a, and s. These letters suggest the corresponding names, flat, low, cusp, high, equatorial, retardation, auroral, and slant, respectively, but are not restrictive. The letter n is used to designate an E_s trace that does not correspond to one of the eight types. The classifications are:

f An E_s trace showing no appreciable increase of height with frequency, usually relatively solid at most latitudes. (This classification may be used only at night; it appears that flat E_s traces observed in the daytime are classified according to their virtual height: h or l.)

l A flat E_s trace at or below the normal E-region minimum virtual height in the day or below the E-region minimum virtual height at night.

c An E_s trace showing a relatively symmetrical cusp at or below $f_o E$. (This is usually continuous with the normal E trace, although when the deviative absorption is large, part or all of the cusp may be missing—usually a daytime type.)

h An E_s trace showing a discontinuity in height with the normal E-region trace at or above $f_o E$ and an asymmetrical cusp. (The low-frequency end of the E_s trace lies clearly above the high-frequency end of the normal E trace—usually a daytime type.)

q An E_s trace that is diffuse and nonblanketing over a wide frequency range, the spread being most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

r An E_s trace that is nonblanketing over part or all of its frequency range, showing an increase in virtual height at the high-frequency

end similar to group retardation. (This is distinguished from the usual group retardation—as in the case of an occulting thick E region—by the lack of group retardation in the F traces at corresponding frequencies and the lack of complete blanketing.)

a An E_s pattern having a well-defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. (These sometimes extend over several hundred kilometers of virtual height.)

s A diffuse E_s trace that rises steadily with frequency, usually emerging from another type of E_s trace. (The rising trace alone is classified as s; the horizontal trace is classified separately. At high latitudes, the slant trace usually starts to rise from a horizontal E_s trace, such as l or f, at frequencies that greatly exceed the E-region critical frequency, e.g., about 6 Mc; whereas at low latitudes it usually rises from equatorial-type E_s, q, c, or h, at frequencies near the regular E critical frequency. Type s is never used to determine f_o E unless echoes clearly identifiable as E_s echoes are seen.)

n An E trace that cannot be classified as one of the standard types. (This must not be used for intermediate cases between any two classes. A choice should always be made whenever possible, even if it is doubtful.)

E. MULTIPLE REFLECTIONS FROM E_s

When the ionogram shows the presence of multiple reflections from E_s, the number of traces seen will be recorded with the letter indicating the type.

Characteristic: f-min

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	E019S	E015S	E	E	E	E016S	E024S	E030S	E023S	E027S	029*	E026S	E028S	E025S
2	E019S	E014S	E	013	E	E017S	E022S	E024S	028	025	032	E030S	E030S	E030S
3	C	C	C	C	C	C	C	C	C	030A	033A	E031S	E030S	E027S
4	E020S	E016S	E	E	E	016	E020S	E023S	E023S	E025S	028	E030S	031	E030S
5	E020S	E	014	E	E	E018S	E022S	E023S	E025S	E024S	035	E030S	040	E028S
6	E021S	E015S	E014S	E	E	E016S	E020S	E022S	E024S	E026S	E029S	E027S	E029S	E028S
7	E020S	017	015	013	E	E015S	E020S	E022S	E021S	031	034	036	036	036
8	E023S	E016S	E015S	E017S	012	B	024	E024S	E023S	036	034	E040S	E030S	E027S
9	022	E	E	013	E	E014S	E020S	E025S	E023S	E027S	E028S	E030S	E030S	E029S
10	E020S	E016S	E012S	E	E	B	E022S	E023S	E028S	037	E029S	E030S	040	E030S
11	E020S	E015S	E013S	E	014	E016S	E022S	E023S	025	026	039	E029S	036	031
12	E019S	E016S	E017S	E	E	E015S	E020S	E024S	028	027	032	E029S	E030S	E030S
13	E020S	E015S	E	013	012	B	E025S	E024S	E023S	030	040	E030S	E030S	E030S
14	B	E017S	019	015	012	E016S	E020S	E022S	025	030	031	E030S	E030S	036
15	B	E018S	E016S	017	E	E017S	E020S	E022S	E024S	029	030	030	E030S	031
16	E022S	E017S	012	B	B	B	E022S	E023S	E022S	028	040	E033S	E033S	031
17	C	E016S	E017S	B	E	B	E021S	E024S	E026S	027	032	E030S	E030S	E030S
18	E020S	E017S	E017S	E017S	E014S	E018S	E020S	025	026	027	031	E030S	E030S	E030S
19	024	E015S	014	B	014	B	E021S	E024S	E029S	034	038	035	036	037
20	E020S	E	E	E	E	E014S	E020S	E020S	E024S	026	031	037	039	040
21	E017S	023	016	014	013	E017S	E019S	E023S	E026S	032	034	E029S	E030S	E030S
22	E020S	E020S	E014S	E016S	017	E016S	E025S	E022S	E024S	E024S	034	E030S	E030S	E030S
23	E020S	E013S	E	E	014	B	E020S	E020S	E026S	E030S	030	C	C	E034S
24	E022S	E020S	E014S	E016S	E	E015S	E024S	E024S	E025S	E027S	E030S	E030S	E030S	E029S
25	E020S	E014S	E012S	E	E	E016S	E022S	E021S	E024S	E030S	E030S	E020S	E032S	E029S
26	E022S	E014S	E015S	E014S	E014S	E016S	E020S	E022S	E023S	E028S	E030S	E030S	E030S	E028S
27	E020S	E017S	E014S	E	E	E016S	E020S	E022S	E025S	C	C	E030S	E030S	E030S
28	B	E015S	E	E016S	E	E015S	E020S	E020S	E023S	E025S	E028S	E030S	E030S	E030S
29	E019S	E014S	E012S	E	E	E013S	E020S	E020S	E022S	E025S	E035S	E032S	E030S	036
30	025	E014S	E	E	E014S	E014S	E020S	E020S	E024S	E030S	E030S	E030S	E032S	E030S
31	E020S	E015S	E016S	E016S	E015S	E015S	E020S	E021S	E026S	E026S	E026S	E030S	E030S	E029S
Median	020	016	014	016	014	016	020	023	024	027	031	030	030	030
Count	26	27	21	14	12	23	30	30	30	30	30	30	30	31
UQ	022	017	016	016	014	016	022	024	026	030	034	030	032	031
LQ	020	015	014	013	013	015	020	022	023	026	030	030	030	029
QR	002	002	002	003	001	001	002	002	003	004	004	000	002	002

* Tabulation of 029 = 2.9 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
S	E027S	029*	E026S	E028S	E025S	035	027	025	E022S	E021S	E020S	E020S	E020S	E020S	E020S
	025	032	E030S	E030S	E030S	030	E028S	C	C	C	C	C	C	C	C
	030A	033A	E031S	E030S	E027S	E029S	E023S	E021S	E020S	E021S	E020S	E021S	026	E022S	E020S
S	E025S	028	E030S	031	E030S	032	E026S	026	E025S	024	E020S	E021S	E022S	E020S	E020S
S	E024S	035	E030S	040	E028S	030	025	E023S	E022S	E023S	E020S	E020S	E025S	E022S	E022S
S	E026S	E029S	E027S	E029S	E028S	E026S	E023S	E024S	E024S	E024S	E020S	EC21S	E020S	E026S	023
S	031	034	036	036	036	C	C	E024S	026	E020S	E020S	E020S	E025S	E020S	E023S
S	036	034	E040S	E030S	E027S	031	E030S	E026S	E022S	E022S	E023S	E022S	E022S	E020S	E020S
S	E027S	E028S	E030S	E030S	E029S	E027S	E025S	E025S	E023S	E022S	E020S	E022S	E022S	E020S	E020S
S	037	E029S	E030S	040	E030S	E028S	035	E024S	E030S	E026S	E026S	E022S	E021S	E026S	E020S
	026	039	E029S	036	031	040	033	030	E022S	E024S	E020S	E024S	E023S	E020S	E020S
	027	032	E029S	E030S	E030S	E029S	E027S	E023S	E021S	E020S	022	E023S	E023S	E024S	E020S
S	030	040	E030S	E030S	E030S	031	028	023	024	E020S	E020S	E020S	E020S	030	E023S
	030	031	E030S	E030S	036	037	E028S	027	E024S	E025S	E020S	E020S	E020S	E020S	E020S
S	029	030	030	E030S	031	030	030	025	024	E022S	E020S	E020S	E020S	E020S	E021S
S	028	040	E033S	E033S	031	030	027	024	E020S	E020S	E020S	E020S	E020S	C	C
S	027	032	E030S	E030S	E030S	E030S	E025S	E023S	E024S	E020S	E021S	E020S	E023S	E023S	E020S
	027	031	E030S	E030S	E030S	E030S	E028S	E023S	E025S	E021S	E021S	E020S	E020S	E023S	E024S
S	034	038	035	036	037	035	035	033	E028S	E024S	E020S	E020S	E023S	E020S	E020S
S	026	031	037	039	040	038	E029S	E027S	E023S	E020S	E020S	E023S	E025S	E023S	E020S
S	032	034	E029S	E030S	E030S	E028S	E027S	E023S	E025S	E023S	E020S	E020S	E025S	E022S	E020S
S	E024S	034	E030S	E030S	E030S	E030S	E025S	E020S	E018S	E020S	E020S	E020S	E020S	E020S	E020S
S	E030S	030	C	C	E034S	E030S	E027S	E025S	E022S	E020S	E020S	E020S	E020S	E020S	E020S
S	E027S	E030S	E030S	E030S	E029S	E029S	E030S	E028S	E030S	E024S	E020S	E023S	E021S	E020S	E020S
S	E030S	E030S	E020S	E032S	E029S	E029S	E025S	E022S	E020S	E020S	E020S	E020S	E020S	E020S	E024S
S	E028S	E030S	E030S	E030S	E028S	E030S	E027S	E021S	E021S	E020S	E020S	E020S	E020S	E022S	E023S
S	C	C	E030S	E030S	E030S	E030S	E025S	E023S	E022S	E020S	E022S	E022S	E022S	E021S	E022S
S	E025S	E028S	E030S	E030S	E030S	E030S	E026S	E023S	E030S	E020S	E020S	025	027	E022S	E020S
S	E025S	E035S	E032S	E030S	036	E030S	027	E026S	E030S	E020S	E022S	E022S	E020S	E020S	E020S
S	E030S	E030S	E030S	E032S	E030S	E028S	E026S	C	E022S	E020S	E020S	E021S	E022S	E020S	E020S
S	E026S	E026S	E030S	E030S	E029S	E029S	E026S	E023S	E022S	E020S	E020S	E020S	E022S	E021S	E020S
	027 30	031 30	030 30	030 30	030 31	030 30	027 30	024 29	023 30	020 30	020 30	020 30	022 30	021 29	020 29
	030 026 004	034 030 004	030 030 000	032 030 002	031 029 002	031 029 002	028 025 003	026 023 003	025 022 003	023 020 003	020 020 000	022 020 002	023 020 003	022 020 002	022 020 002

B

Characteristic: f_0F_2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	045*	038	030	F	F	025	040	061	063	067	070	069	067	066
2	A	A	A	F	A	A	040	056	065	064	067	074	075	075
3	C	C	C	C	C	C	C	C	C	A	A	A	A	A
4	U038F	F	F	A	A	A	042	051	063	067	057	E044G	A	A
5	U038F	033	028	029	025	A	036	063	078	077	069H	062H	067	065
6	R	017	017	014	A	A	035	061	064	068H	066H	064H	060H	057
7	044	040	037	031	030	026	U032S	A	065	076	077	080	081	090
8	060	U052S	F	025	022	B	037	058	066	057	066	064	060	062
9	040	031	029	A	A	A	U037S	055	068	077	075	071	061	A
10	F	U032F	026	F	019	B	025	060	070	075	072	062	063	070
11	035	026	F	022	021	A	033	056	071	071	075	068	066	065
12	050	F	F	A	A	022	A	062	070	063H	060H	053	A	A
13	033	026	026	016	U013R	B	034	060	075	072	067H	063H	065	A
14	B	A	A	A	A	A	031	051	066	A	054	057	057	058
15	B	F	A	A	A	A	033	052	078	072	A	050	051	A
16	029	U024F	A	B	B	B	035	058	065	067	068	067H	A	A
17	C	F	F	B	017	B	036	053	065	072	065H	058H	054	A
18	032	F	F	F	U021F	A	034	055S	060	065	067H	063	064	060
19	A	F	A	B	A	B	033	055	060	077	075	072H	066H	060H
20	U033F	F	U034F	A	A	A	A	A	070	072	075	076	070	064
21	046F	F	U035F	F	A	A	032	058	070	077	070H	060H	070H	060H
22	025	026	023	A	A	A	031	052	063	069	072H	067	A	061H
23	A	A	A	A	A	B	028	047	056	064	057	056H	A	056H
24	051	F	F	F	F	F	034	054	070	075	077	074	077	075
25	F	F	F	F	F	A	035	062	062H	077	075H	073H	069	069
26	042	038	031	F	U018F	A	033	064	061	059	063	065H	065H	063H
27	F	F	F	041	F	F	039	056	058	C	C	063H	066H	070
28	023	U021S	018	R	A	A	030	057	068	062	062H	064H	058	070
29	040	U032F	F	F	F	020	U030S	055	065	064H	065H	061	065H	060H
30	031	U034F	F	025	020	F	U031S	060	069	064H	A	A	A	A
31	045	F	F	F	034	020	029	050	059	056	056	056H	052	057
Median	039	032	029	025	021	022	033	056	065	069	067	064	065	064
Count	20	15	12	8	11	5	28	28	30	28	27	29	24	21
UQ	045	038	033	030	025	026	036	060	070	075	075	070	068	070
LQ	033	026	025	021	018	020	031	054	063	064	063	059	060	060
QR	012	012	008	009	007	006	005	006	007	011	012	011	008	010

* Tabulation of 045 = 4.5 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
063	067	070	069	067	066	068	069	064	068	075	088	057	043	037	032
065	064	067	074	075	075	077	076	C	C	C	C	C	C	C	C
C	A	A	A	A	A	070	069	074	077	080	088	060	063	U067S	U060F
063	067	057	E044G	A	A	066	071	070	070	075	080	075	064	056	042
078	077	069H	062H	067	065	065	071	078	A	088	103	072	060	029	026
064	068H	066H	064H	060H	057	U064R	069	074	080	082	086	082	076	056	049
065	076	077	080	081	090	086	C	077H	075	071	084	088	076	067	057
066	057	066	064	060	062	064	074	080	085	088	094	056	045	049	054
068	077	075	071	061	A	072	070	A	065	U067S	071	069	072	069	050
070	075	072	062	063	070	073	077	078	085	078	080	078	064	037	034
071	071	075	068	066	065	062	065	070	063	064H	060	062	061	062	060
070	063H	060H	053	A	A	R	A	065	065H	067H	077	077	054	043	034
075	072	067H	063H	065	A	064H	R	084	076	A	085	077	060	041	033
066	A	054	057	057	058	059	057	065	073	077	098	070	054	035	A
078	072	A	050	051	A	060H	065	065	072	085	084	072	056	048	037
065	067	068	067H	A	A	A	069	076	A	100	078	055	048	C	C
065	072	065H	058H	054	A	060H	062	066	073	E020S	E021S	E020S	E023S	E023S	E020S
060	065	067H	063	064	060	061H	070H	075	082	086	090	054	045	034	F
060	077	075	072H	066H	060H	051	059	066	077	069	080	070	057	049	U035F
070	072	075	076	070	064	058	065	066	067	U074S	081	066	056	050	046F
070	077	070H	060H	070H	060H	067	067	065H	069H	079	107	061	033	032	029
063	069	072H	067	A	061H	A	058	070	087	080	070	065	077	035	A
056	064	057	056H	A	056H	062H	063	067	067	067	076	076	078	060	057
070	075	077	074	077	075	077	078	082	079	090	087	057	041	033	U024S
062H	077	075H	073H	069	069	068H	070H	070H	071H	082	087	087	062	U052S	048
061	059	063	065H	065H	063H	065H	067	068	067	067	069	U070S	F	F	U062F
058	C	C	063H	066H	070	076	080	087	094	099	079	070	040	A	026
068	062	062H	064H	058	070	067H	068	073	077	082	077	084	078	053	049
065	064H	065H	061	065H	060H	059	063	072	089	093	066	058	055	043	040
069	064H	A	A	A	A	A	A	C	056	072	068	070	063	052	050
059	056	056	056H	052	057	060	063	067	068	071	078	D080R	049	041	034
065	069	067	064	065	064	065	069	070	073	078	080	070	057	048	041
30	28	27	29	24	21	27	27	28	28	29	30	30	29	27	26
070	075	075	070	068	070	070	071	077	080	086	087	077	064	056	050
063	064	063	059	060	060	060	063	066	067	070	076	060	047	035	033
007	011	012	011	008	010	010	008	011	013	016	011	017	017	021	017

B

Characteristic: M(3000)F_2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	300*	330	315	F	F	350	345	340	315	295	255	230	225	22
2	A	A	A	F	A	A	350	350	335	315	260	260	250	25
3	C	C	C	C	C	C	C	C	C	A	A	A	A	A
4	U290F	F	F	A	A	A	350	300	280	235	360	Q	A	A
5	U280F	290	300	310	330	A	330	320	310	270	230H	225H	215	24
6	E	335	340	360	A	A	330	325	285	250H	235H	220H	225H	25
7	290	315	305	310	310	280	U240S	A	275	270	280	270	265	30
8	330	U330S	F	330	350	B	310	310	270	290	215	260	270	21
9	290	315	330	A	A	A	U340S	310	295	260	250	225	255	A
10	F	U310F	340	F	325	B	320	310	280	270	235	240	250	23
11	330	320	F	340	355	A	325	320	320	290	255	230	230	22
12	320	F	F	A	A	340	A	330	305	250H	215H	270	A	A
13	305	300	355	345	U340H	B	340	330	320	280	235H	220H	230	A
14	B	A	A	A	A	A	325	315	280	A	260	245	265	26
15	B	F	A	A	A	B	340	305	310	260	A	250	240	A
16	290	U280F	A	B	B	B	340	340	340	305	265	230H	A	A
17	C	F	F	B	330	B	355	330	305	270	225H	225H	230	A
18	300	F	F	F	U295F	A	350	335S	300	265	225H	275	245	245
19	A	F	A	B	A	A	330	340	325	320	275	230H	310H	220
20	U275F	F	U330F	A	A	A	A	A	285	275	260	235	240	235
21	245F	F	U310F	F	A	A	315	315	275	325	205H	195H	190H	225
22	295	330	350	A	A	A	330	330	305	280	270H	290	A	245
23	A	A	A	A	A	A	320	290	260	250	260	230H	A	240
24	295	F	F	F	F	B	330	320	325	310	300	285	270H	260
25	F	F	F	F	F	F	330	350	300H	300	270H	245H	260	250
26	310	330	360	F	U295F	A	335	360	345	310	275	250H	230H	235
27	F	F	V	330	F	A	360	330	300	C	C	240H	240H	250
28	295	U300S	310	R	A	A	310	320	305	255	230H	230H	250	230
29	305	U275F	F	F	F	370	U335S	315	275	230H	230H	240	230H	230
30	285	U290F	F	325	340	F	U310S	320	305	250H	A	A	A	A
31	280	F	F	F	350	355	315	290	255	275	260	220H	245	235
Median	295	315	323	330	330	350	330	320	308	275	255	237	240	238
Count	20	15	12	c	11	5	28	28	30	28	27	28	24	23
UQ	305	330	340	34.1	350	363	340	332	315	297	265	255	252	250
LQ	288	290	308	318	310	310	320	313	280	258	225	225	228	225
QR	017	040	032	024	040	053	020	019	035	039	040	030	024	025

* Tabulation of 300 = factor of 3.0.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
315	295	255	230	225	225	225	240	245	245	265	325	325	300	290	280
335	315	260	260	250	255	260	250	C	C	C	C	C	C	C	C
C	A	A	A	A	A	260	255	255	270	285	320	310	310	U330S	U300F
280	295	260	G	A	A	260	260	250	250	265	285	290	330	320	300
310	270	230H	225H	215	245	260	250	260	A	305	340	310	370	340	310
285	250H	235H	220H	225H	255	U350R	250	255	265	270	280	330	315	290	280
275	270	280	270	265	260	260	C	230H	230	265	270	300	300	310	300
270	290	215	260	270	215	220	270	285	295	305	330	315	290	305	310
295	280	250	225	255	A	245	250	A	250	U265S	235	290	305	310	300
280	270	235	240	250	235	230	240	250	275	285	290	330	345	335	310
320	290	255	220	220	225	225	240	260	250	250H	280	280	290	300	330
305	250H	215H	270	A	A	B	A	230	230H	245H	290	335	310	320	320
320	280	235H	220H	230	A	220H	B	310	320	A	335	350	350	330	290
290	A	260	245	265	265	215H	260	270	270	280	335	350	345	320	A
310	260	A	250	240	A	215H	250	250	255	280	320	320	305	310	300
340	305	265	230H	A	A	A	245	265	A	345	340	330	310	C	C
305	270	225H	225H	230	A	210H	245	245	265	295	310	310	350	340	320
300	265	225H	275	245	245	215H	240H	270	290	320	335	325	340	320	F
325	330	275	230H	210H	220H	245	260	270	280	310	330	335	325	310	U285F
285	275	260	235	240	235	250	245	235	265	U275S	315	285	285	275	F
275	325	205H	195H	190H	225H	245	245	235H	245H	285	350	355	335	320	310
305	280	270H	290	A	245H	A	270	260	295	330	320	325	360	330	A
260	250	260	230H	A	240H	215H	240	235	260	255	280	300	330	330	310
325	310	300	285	270H	260H	250H	245	270	300	320	340	350	310	320	U320S
300H	300	270H	245H	260	250	240H	235H	240H	250H	380	300	330	325	U320S	325
345	310	275	250H	230H	235H	225H	245	245	235	260	270	U305S	F	F	U310F
300	C	C	240H	240H	250	260	280	285	295	330	335	340	345	A	300
305	255	230H	230H	250	230	245H	240	270	270	295	300	310	330	340	330
275	230H	230H	240	230H	230H	240	245	260	300	335	330	315	300	U270F	275
305	250H	A	A	A	A	A	A	C	270	285	315	310	320	295	280
255	275	260	220H	245	225	245	250	270	260	255	290	U340R	300	280	275
30H	275	255	237	240	238	245	245	257	265	285	318	320	320	320	300
30	28	27	28	24	22	27	27	28	28	29	30	30	29	28	25
315	297	265	255	252	250	250	255	270	285	307	335	335	342	330	315
180	258	225	225	228	235	220	240	245	250	265	290	310	303	300	288
035	039	040	030	024	025	030	015	025	035	042	045	025	039	030	027

B

Characteristic: $h'F_2$

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minut
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	–	–	–	–	–	–	–	260*	315	350	390	E600A	470	E50
2	–	–	–	–	–	–	–	270	300	340	410	400	370	39
3	–	–	–	–	–	–	–	C	C	A	A	A	A	A
4	–	–	–	–	–	–	–	L	350	420	430	G	A	A
5	–	–	–	–	–	–	–	L	U320L	U370L	400H	470H	480	42
6	–	–	–	–	–	–	–	290	330	350H	375H	500H	505H	47
7	–	–	–	–	–	–	–	A	L	340	320	380	400	40
8	–	–	–	–	–	–	–	U300L	L	E340A	470	420	440	55
9	–	–	–	–	–	–	–	L	320	370	400	430	460	A
10	–	–	–	–	–	–	–	L	U280L	U340L	500	400	410	44
11	–	–	–	–	–	–	–	U270L	310	380	400	450	450	45
12	–	–	–	–	–	–	–	L	300	430	500H	540	A	A
13	–	–	–	–	–	–	–	280	290	390	400H	470H	460	A
14	–	–	–	–	–	–	–	L	300	A	470	E460A	450	43
15	–	–	–	–	–	–	–	L	320	U360L	A	530	540	A
16	–	–	–	–	–	–	–	270	290	340	400	440H	A	A
17	–	–	–	–	–	–	–	L	320	360	440H	510H	505	A
18	–	–	–	–	–	–	–	L	U330L	380H	460H	380	420	42
19	–	–	–	–	–	–	–	L	330	310	330	390H	500H	56
20	–	–	–	–	–	–	–	A	330	360	375	420	400	45
21	–	–	–	–	–	–	–	306	370	412	550H	630	570H	53
22	–	–	–	–	–	–	–	L	330	380	400H	340	A	45
23	–	–	–	–	–	–	–	L	375	390	430	500H	A	48
24	–	–	–	–	–	–	–	L	300	320	360	390	400H	40
25	–	–	–	–	–	–	–	250	350	325	390H	430H	400	40
26	–	–	–	–	–	–	–	270	280	340	405	490H	420	45
27	–	–	–	–	–	–	–	L	L	C	C	440H	440	41
28	–	–	–	–	–	–	–	L	280	390	450H	460H	450	42
29	–	–	–	–	–	–	–	L	310	400H	430H	440	480H	46
30	–	–	–	–	–	–	–	L	280	410H	A	A	A	A
31	–	–	–	–	–	–	–	L	L	380	420	530H	500	55
Median	–	–	–	–	–	–	–	270	318	365	405	445	455	450
Count	–	–	–	–	–	–	–	10	26	28	27	28	24	22
UQ	–	–	–	–	–	–	–	290	330	390	450	500	490	480
LQ	–	–	–	–	–	–	–	270	300	340	390	410	415	420
QR	–	–	–	–	–	–	–	020	030	050	060	090	075	060

* Tabulation of 260 = 260 km.

IONOSPHERIC DATA
eep: 1 Mc to 25 Mc in 0.5 minute
July 1965

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
350	390	E600A	470	E500A	445	410	L	L	-	-	-	-	-	-
340	410	400	370	390	400	440	C	C	-	-	-	-	-	-
A	A	A	A	A	380	380	350	350	L	-	-	-	-	-
420	430	G	A	A	408	400	U380L	L	L	-	-	-	-	-
U370L	400H	470H	480	420	410	460	E460A	A	-	-	-	-	-	-
350H	375H	500H	505H	470	425	380	400	350	L	-	-	-	-	-
340	320	380	400	400	370	C	E400A	L	-	-	-	-	-	-
E340A	470	420	440	550	500	370	350	330	-	-	-	-	-	-
370	400	430	460	A	400	400	A	L	-	-	-	-	-	-
U340L	500	400	410	440	420	410	380	320	-	-	-	-	-	-
380	400	450	450	450	470	440	350	L	-	-	-	-	-	-
430	500H	540	A	A	410	A	L	L	-	-	-	-	-	-
390	400H	470H	460	A	470H	360	310	320	A	-	-	-	-	-
A	470	E460A	450	430	530H	440	360	345	-	-	-	-	-	-
U360L	A	530	540	A	510	380	380	390	U320L	-	-	-	-	-
340	400	440H	A	A	A	460	E450A	A	-	-	-	-	-	-
360	440H	510H	505	A	455H	420	410	340	L	-	-	-	-	-
380H	460H	380	420	420	500H	400	370	320	L	-	-	-	-	-
310	330	390H	500H	560H	520	400	330	310	270	-	-	-	-	-
360	375	420	400	450	410	400	400	325	-	-	-	-	-	-
412	550H	630	570H	530H	400	U410L	430	400	U300L	-	-	-	-	-
380	400H	340	A	450H	A	410	400	305	-	-	-	-	-	-
390	430	500H	A	480H	500H	420	400	L	330	-	-	-	-	-
320	360	390	400H	400H	460H	360	340	320	290	-	-	-	-	-
325	390H	430H	400	400	405H	370H	U400L	340H	-	-	-	-	-	-
340	405	490H	420	450H	490H	E480A	E440A	E350A	-	-	-	-	-	-
C	C	440H	440	410	390	350	350	U310L	-	-	-	-	-	-
390	450H	460H	450	420	E410A	U380L	340	L	-	-	-	-	-	-
400H	430H	440	480H	460H	450	430	400	310	260	-	-	-	-	-
410H	A	A	A	A	A	A	C	E410A	-	-	-	-	-	-
380	420	530H	500	550	425	405	370	330	450	-	-	-	-	-
365	405	445	455	450	425	402	380	330	300	-	-	-	-	-
28	27	28	24	22	28	28	26	20	7	-	-	-	-	-
390	450	500	490	480	480	425	400	350	330	-	-	-	-	-
340	390	410	415	420	409	380	350	320	270	-	-	-	-	-
050	060	090	075	060	071	045	050	030	060	-	-	-	-	-

B

Characteristic: h'F

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	270*	270	345	300	280	280	260	E240S	220	220	210	A	A	A
2	A	A	A	280	A	A	240	240	230	215	200	200	270	270
3	C	C	C	C	C	C	C	C	C	A	A	A	A	A
4	290	260	240	A	A	A	440	230	A	A	210	E215A	A	A
5	E320S	315	330	290	260	A	270	240	220	210	E193A	180	205	190
6	E360B	300	280	290	A	A	280	230	230	200	E220A	200	190	E240A
7	240	250	270	265	270	E350A	E530A	A	240	E300A	E280A	A	A	A
8	270	240	290	300	250	B	E320A	230	210	A	A	200	200	200
9	310	310	315	A	A	A	260	240	210	E200A	200	A	A	A
10	320	280	250	250	260	B	360	240	220	215	200	200	200	E240A
11	260	300	300	280	E260A	A	280	240	240	E270A	220	210	A	E230A
12	300	250	240	A	A	300	A	E230A	E220A	A	A	200	A	A
13	285	280	250	240	E320B	B	280	E240A	216	200	E230A	180	E220A	A
14	B	A	A	A	A	A	E340A	E240A	A	A	180	A	200	160
15	B	350	A	A	A	A	300	240	A	200	A	190	A	A
16	350	380	A	B	B	B	250	240	220	200	200	A	A	A
17	C	310	350	B	E290A	B	250	220	210	E200A	E200A	E200A	200	A
18	330	360	325	U450B	350H	A	250	230	220	210	E210A	A	200	190
19	A	340	A	B	A	B	270	240	E300A	A	200	190	190	200
20	380	310	290	A	A	A	A	A	A	E230A	200	200	200	200
21	E400A	U330H	E265A	F	A	A	E330A	A	255	210	235	265	E230A	E260A
22	E370A	E320A	270	A	A	A	E300S	250	230	200	A	A	A	A
23	A	A	A	A	A	B	300	E270A	E260A	E230A	A	A	A	A
24	300	U300S	U320S	280	230	250	U280S	E250S	E240A	200	A	A	A	A
25	310	250	E270A	U350S	U290S	A	300	E245A	A	210	E230A	205	A	E220C
26	300	300	310H	U390H	350	A	E260S	240	220	215	200	200	E200A	200
27	255	260	240	240	235	250	250	E240A	E300A	C	C	E240A	205	190
28	E400B	320	270	E330S	A	A	300	230	220	200	A	A	A	A
29	300	310	270	280	250	E255A	E330A	250	220	310	200	200	200	200
30	340	300	265	270	260	300	E300S	240	230	E270A	A	A	A	A
31	320	320H	290H	300H	250	U250S	U300S	E230A	E240A	E250A	200	205	A	E240A
Median	310	300	275	285	260	267	285	240	220	210	200	200	200	200
Count	24	27	24	18	16	8	28	27	25	24	21	19	15	16
UQ	345	320	312	300	290	300	300	240	240	225	220	205	205	240
LQ	295	270	265	270	250	250	260	230	220	200	200	200	200	195
QR	050	050	047	030	040	050	040	010	020	025	020	005	005	045

* Tabulation of 270 = 270 km.

F

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
30	220	210	A	A	A	E230A	270	E240A	240	290	260	210	290	340	375
00	215	200	200	270	270	190	200	C	C	C	C	C	C	C	C
C	A	A	A	A	A	A	E250A	A	A	260	240	250	270	260	280
A	A	210	E215A	A	A	A	200	180H	220	240	260	240	250	270	280
20	210	E193A	180	205	190	190	A	A	A	320	240	240	215	280	320
00	200	E220A	200	190	E240A	E240A	220	230	E250A	E280A	280	270	250	270	310
40	E300A	E280A	A	A	A	210	C	A	E250A	260	290	270	230	260	300
10	A	A	200	200	200	E250A	200	210	230	270	250	250	320	300	280
10	E300A	200	A	A	A	A	A	A	250	280	260	270	280	270	310
00	215	200	200	200	E240A	200	210	210	230	240	245	230	225	240	300
40	E270A	220	210	A	E230A	225	220	190	240	240H	250	300	280	260	250
30A	A	A	200	A	A	A	A	E260A	E320A	350	300	240	240	280	280
18	200	E230A	180	E2.0A	A	A	A	A	A	A	300	220	230	280	370
7	A	180	A	200	160	200	190	190	230	240	240	210	230	E300A	A
4	200	A	190	A	A	E210A	230	205	200	240	250	240	270	260	310
20	20C	200	A	A	A	A	A	A	A	255	240	240	290	C	C
10	E200A	E200A	E200A	200	A	E200A	200	A	260	E280A	250	250	278	230	280
30	210	E210A	A	200	190	200	E220A	E270A	E230A	240	250	210	230	270	290
30A	A	200	190	190	200	200	260	E200B	210	E230S	250	250	270	270	330
A	E330A	200	200	200	200	200	E200A	190	250	U350S	E300A	E290S	E290S	E350S	E380S
55	210	235	265	E230A	E260A	E190A	E.s0A	A	230	250	245	200	280	E300S	320
30	200	A	A	A	A	A	A	A	E250A	260	260	260	220	E280A	A
80A	E230A	A	A	A	A	A	A	205	230	A	300	260	250	250	270
40A	200	A	A	A	A	200	200	200	E220S	E150S	230	240	270	300	U330S
A	210	E230A	205	A	E220C	A	E230A	200	A	E200A	240	230	260	280	295
20	215	200	200	E200A	200	A	A	A	A	280	260	270	U330S	U270S	260
00A	C	C	E240A	205	190	E240A	200	A	220	360	255	245	250	A	E360S
20	200	A	A	A	A	A	210	190H	E230S	E280A	260	265	235	230	260
20	210	200	200	200	200	180	200	205	230	220	220	260	290	300	240
30	E270A	A	A	A	A	A	A	C	A	300	250	270	260	280	305
40A	E250A	200	205	A	E240A	E220A	200	E250A	220	E250A	250	230	280	330	370
20	210	200	200	200	200	200	200	205	230	260	250	250	260	275	300
25	24	21	19	15	16	19	21	18	23	23	30	30	30	28	27
40	225	220	205	205	240	225	220	220	250	280	260	265	280	300	330
30	200	200	200	300	195	300	200	190	230	240	245	240	230	260	280
90	025	020	005	005	045	025	020	030	030	040	015	025	050	040	050

B

Characteristic: foF1

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	-	-	-	-	-	-	L	L	043*	044	A	A	A
2	-	-	-	-	-	-	-	L	L	043	043	044	044	044
3	-	-	-	-	-	-	-	C	C	A	A	A	A	A
4	-	-	-	-	-	-	-	L	A	A	043	044	A	A
5	-	-	-	-	-	-	-	L	L	042	044	045	045	045
6	-	-	-	-	-	-	-	L	U041L	042	044	045	045	044
7	-	-	-	-	-	-	-	L	L	L	044	A	A	A
8	-	-	-	-	-	-	-	L	L	A	A	044	045	045
9	-	-	-	-	-	-	-	L	L	L	U045L	A	A	A
10	-	-	-	-	-	-	-	L	L	L	046	045	045	U046R
11	-	-	-	-	-	-	-	L	L	U044L	043	045	A	044
12	-	-	-	-	-	-	-	L	L	A	A	045	A	A
13	-	-	-	-	-	-	-	L	040	U046L	044	044	044	A
14	-	-	-	-	-	-	-	L	A	A	044	A	U045R	045
15	-	-	-	-	-	-	-	L	A	042	A	045	A	A
16	-	-	-	-	-	-	-	L	L	042	044	A	A	A
17	-	-	-	-	-	-	-	L	L	042	044	045	U046R	045
18	-	-	-	-	-	-	-	L	L	043	U043R	A	045	044
19	-	-	-	-	-	-	-	L	L	A	043	044	045	045
20	-	-	-	-	-	-	-	L	A	U043L	043	045	045	U045R
21	-	-	-	-	-	-	-	A	040	042	043	A	044	U045R
22	-	-	-	-	-	-	-	A	041	U044R	A	A	A	A
23	-	-	-	-	-	-	-	L	041	042	A	A	A	A
24	-	-	-	-	-	-	-	L	L	U044L	A	A	A	A
25	-	-	-	-	-	-	-	L	A	042	044	043	A	044
26	-	-	-	-	-	-	-	L	L	U042L	043	044	044	043
27	-	-	-	-	-	-	-	L	L	C	C	U044R	044	044
28	-	-	-	-	-	-	-	L	L	044	A	A	A	A
29	-	-	-	-	-	-	-	L	U041L	043	A	044	044	044
30	-	-	-	-	-	-	-	L	038	042	A	A	A	A
31	-	-	-	-	-	-	-	L	L	042	044	044	A	044
Median Count	-	-	-	-	-	-	-	-	041	042	044	044	045	044
	-	-	-	-	-	-	-	-	7	21	21	19	15	16
UQ	-	-	-	-	-	-	-	-	041	043	044	045	045	045
LQ	-	-	-	-	-	-	-	-	040	042	043	044	044	044
QR	-	-	-	-	-	-	-	-	001	001	001	001	001	001

* Tabulation of 043 = 4.3 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	043*	044	A	A	A	044	044	U042L	L	-	-	-	-	-	-
	043	043	044	044	044	043	042	C	C	-	-	-	-	-	-
	A	A	A	A	A	A	043	A	A	L	-	-	-	-	-
	A	043	044	A	A	A	043	U041L	L	L	-	-	-	-	-
	042	044	045	045	045	044	A	A	A	-	-	-	-	-	-
1L	042	044	045	045	044	045	043	U042L	L	L	-	-	-	-	-
	L	044	A	A	A	044	C	A	L	-	-	-	-	-	-
	A	A	044	045	045	U043R	043	U041L	U039L	-	-	-	-	-	-
	L	U045L	A	A	A	A	A	A	L	-	-	-	-	-	-
	L	046	045	045	U046R	046	044	043	L	-	-	-	-	-	-
	U044L	043	045	A	044	044	042	U042L	L	-	-	-	-	-	-
	A	A	045	A	A	A	A	L	L	-	-	-	-	-	-
0	U043L	044	044	044	A	A	A	A	A	A	-	-	-	-	-
	A	044	A	U045R	045	U045R	044	041	L	-	-	-	-	-	-
	042	A	045	A	A	044	044	040	039	L	-	-	-	-	-
	042	044	A	A	A	A	A	A	A	-	-	-	-	-	-
	042	044	045	U046R	A	U043R	043	A	U040L	L	-	-	-	-	-
	043	U043R	A	045	044	U045R	041	041	L	L	-	-	-	-	-
	A	043	044	045	045	U044R	042	042	038	L	-	-	-	-	-
	U043L	043	045	045	U045R	043	043	041	U038L	-	-	-	-	-	-
0	042	043	045	044	U045R	044	L	A	040	L	-	-	-	-	-
1	U044R	A	A	A	A	A	A	A	039	-	-	-	-	-	-
1	042	A	A	A	A	A	A	042	L	A	-	-	-	-	-
	U044L	A	A	A	A	044	042	U039L	L	L	-	-	-	-	-
	042	044	043	A	044	A	042	U043L	A	-	-	-	-	-	-
	U042L	043	044	044	043	A	A	A	A	-	-	-	-	-	-
	C	C	U044R	044	044	U044R	042	A	U036L	-	-	-	-	-	-
	044	A	A	A	A	A	U042L	040H	L	-	-	-	-	-	-
1L	043	044	044	044	044	043	044	042	L	L	-	-	-	-	-
9	042	A	A	A	A	A	A	C	A	-	-	-	-	-	-
	042	044	044	A	044	043	042	042	U038L	L	-	-	-	-	-
1	042	044	044	045	044	044	043	042	038	-	-	-	-	-	-
	21	21	19	15	16	19	20	17	9	-	-	-	-	-	-
1	043	044	045	045	045	044	043	042	039	-	-	-	-	-	-
0	042	043	044	044	044	043	042	041	038	-	-	-	-	-	-
1	001	001	001	001	001	001	001	001	001	-	-	-	-	-	-

B

Characteristic: M(3000)F1

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minut
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	1
1	–	–	–	–	–	–	–	L	L	380*	380	A	A	A
2	–	–	–	–	–	–	–	L	L	400	410	430	420	43
3	–	–	–	–	–	–	–	C	C	A	A	A	A	A
4	–	–	–	–	–	–	–	L	A	A	400	410	A	A
5	–	–	–	–	–	–	–	L	L	380	390	410	410	43
6	–	–	–	–	–	–	–	L	U375L	390	400	410	430	41
7	–	–	–	–	–	–	–	A	L	L	365	A	A	A
8	–	–	–	–	–	–	–	L	L	A	A	400	430	41
9	–	–	–	–	–	–	–	L	L	L	U380L	A	A	A
10	–	–	–	–	–	–	–	L	L	L	370	400	405	U39
11	–	–	–	–	–	–	–	L	L	U370L	400	380	A	41
12	–	–	–	–	–	–	–	L	L	A	A	400	A	A
13	–	–	–	–	–	–	–	L	375	U360L	400	415	410	A
14	–	–	–	–	–	–	–	L	A	A	400	A	U420R	41
15	–	–	–	–	–	–	–	L	A	415	A	410	A	A
16	–	–	–	–	–	–	–	L	L	385	410	A	A	A
17	–	–	–	–	–	–	–	L	L	400	400	400	U410R	A
18	–	–	–	–	–	–	–	L	L	375	U400R	A	410	420
19	–	–	–	–	–	–	–	L	L	A	410	430	420	400
20	–	–	–	–	–	–	–	L	A	U375L	410	390	420	U425
21	–	–	–	–	–	–	–	A	350	380	380	365	375	U400
22	–	–	–	–	–	–	–	A	355	U380R	A	A	A	A
23	–	–	–	–	–	–	–	L	350	390	A	A	A	A
24	–	–	–	–	–	–	–	L	L	U365L	A	A	A	A
25	–	–	–	–	–	–	–	L	A	375	390	415	A	410
26	–	–	–	–	–	–	–	L	L	U400L	420	410	400	420
27	–	–	–	–	–	–	–	L	L	C	C	U390R	415	425
28	–	–	–	–	–	–	–	L	L	365	A	A	A	A
29	–	–	–	–	–	–	–	L	U355L	370	385	410	420	410
30	–	–	–	–	–	–	–	L	375	360	A	A	A	A
31	–	–	–	–	–	–	–	L	L	370	400	405	A	400
Median	–	–	–	–	–	–	–	–	355	380	400	410	415	410
Count	–	–	–	–	–	–	–	–	7	21	21	19	15	16
UQ	–	–	–	–	–	–	–	–	375	390	405	410	420	422
LQ	–	–	–	–	–	–	–	–	350	370	382	400	410	405
QR	–	–	–	–	–	–	–	–	025	020	023	010	010	017

* Tabulation of 380 = factor of 3.8

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
L	380*	380	A	A	A	395	370	U370L	L	–	–	–	–	–	–
L	400	410	430	420	430	425	400	C	C	–	–	–	–	–	–
C	A	A	A	A	A	A	400	A	A	L	–	–	–	–	–
A	A	400	410	A	A	A	405	U390L	L	L	–	–	–	–	–
L	380	390	410	410	430	400	A	A	A	–	–	–	–	–	–
U375L	390	400	410	430	410	405	400	U380L	L	L	–	–	–	–	–
L	L	365	A	A	A	420	C	A	L	–	–	–	–	–	–
L	A	A	400	430	410	U400R	385	U380L	U375L	–	–	–	–	–	–
L	L	U380L	A	A	A	A	A	A	L	–	–	–	–	–	–
L	L	370	400	405	U390R	380	375	370	L	–	–	–	–	–	–
L	U370L	400	380	A	410	405	400	U410L	L	–	–	–	–	–	–
L	A	A	400	A	A	A	A	L	L	–	–	–	–	–	–
375	U360L	400	415	410	A	A	A	A	A	A	–	–	–	–	–
A	A	400	A	U420R	410	U420R	405	410	L	–	–	–	–	–	–
A	415	A	410	A	A	400	400	410	360	L	–	–	–	–	–
L	385	410	A	A	A	A	A	A	A	–	–	–	–	–	–
L	400	400	400	U410R	A	U430R	400	A	U350L	L	–	–	–	–	–
L	375	U400R	A	410	420	U400R	410	370	L	L	–	–	–	–	–
L	A	410	430	420	400	U405R	375	370	385	L	–	–	–	–	–
A	U375L	410	390	420	U425R	430	390	405	U380L	–	–	–	–	–	–
350	380	380	365	375	U400R	405	L	A	345	L	–	–	–	–	–
355	U380R	A	A	A	A	A	A	A	370	–	–	–	–	–	–
350	390	A	A	A	A	A	A	370	L	A	–	–	–	–	–
L	U365L	A	A	A	A	400	415	U390L	L	L	–	–	–	–	–
A	375	390	415	A	410	A	390	U375L	A	–	–	–	–	–	–
L	U400L	420	410	400	420	A	A	A	A	–	–	–	–	–	–
L	C	C	U390R	415	425	U390R	400	A	U385L	–	–	–	–	–	–
L	365	A	A	A	A	A	U415L	390H	L	–	–	–	–	–	–
355L	370	385	410	420	410	425	400	375	L	L	–	–	–	–	–
375	360	A	A	A	A	A	A	C	A	–	–	–	–	–	–
L	370	400	405	A	400	410	400	365	U365L	L		–	–	–	–
355	380	400	410	415	410	405	400	380	370	–	–	–	–	–	–
7	21	21	19	15	16	19	20	17	9	–	–	–	–	–	–
375	390	405	410	420	422	420	402	397	383	–	–	–	–	–	–
350	370	382	400	410	405	400	390	370	355	–	–	–	–	–	–
025	020	023	010	010	017	020	012	027	028	–	–	–	–	–	–

B

Characteristic: foE

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	–	–	–	–	–	–	–	S	S	S	B	D300A	A	A
2	–	–	–	–	–	–	–	S	B	D310A	D340A	D330A	A	D320R
3	–	–	–	–	–	–	–	C	C	B	B	S	S	S
4	–	–	–	–	–	–	–	A	A	A	D310A	S	A	A
5	–	–	–	–	–	–	–	S	D280A	D300A	B	U340R	B	A
6	–	–	–	–	–	–	–	A	A	S	S	A	A	A
7	–	–	–	–	–	–	–	A	A	B	B	B	B	B
8	–	–	–	–	–	–	–	S	A	B	B	S	A	A
9	–	–	–	–	–	–	–	A	A	A	A	A	A	A
10	–	–	–	–	–	–	–	S	S	B	D320R	330	B	S
11	–	–	–	–	–	–	–	A	A	A	B	A	B	D340A
12	–	–	–	–	–	–	–	S	B	A	A	A	A	A
13	–	–	–	–	–	–	–	S	A	A	B	A	A	A
14	–	–	–	–	–	–	–	A	A	A	A	A	A	B
15	–	–	–	–	–	–	–	A	A	A	A	A	A	A
16	–	–	–	–	–	–	–	A	A	D330R	B	S	A	A
17	–	–	–	–	–	–	–	S	D270A	A	B	S	S	A
18	–	–	–	–	–	–	–	A	S	A	A	A	A	A
19	–	–	–	–	–	–	–	S	S	B	B	B	B	B
20	–	–	–	–	–	–	–	A	A	A	A	B	B	B
21	–	–	–	–	–	–	–	A	S	U320B	B	A	S	S
22	–	–	–	–	–	–	–	S	D290A	310	B	S	A	A
23	–	–	–	–	–	–	–	A	S	S	A	C	C	S
24	–	–	–	–	–	–	–	S	S	S	A	A	A	A
25	–	–	–	–	–	–	–	S	S	S	S	A	S	S
26	–	–	–	–	–	–	–	S	S	S	S	S	S	S
27	–	–	–	–	–	–	–	A	A	C	C	S	S	A
28	–	–	–	–	–	–	–	S	S	S	S	A	S	A
29	–	–	–	–	–	–	–	S	S	S	S	S	S	S
30	–	–	–	–	–	–	–	S	S	S	A	A	A	A
31	–	–	–	–	–	–	–	S	S	S	S	S	A	S
Median	–	–	–	–	–	–	–	–	280	310	320	330	–	330
Count	–	–	–	–	–	–	–	–	3	5	3	4	–	2
UQ	–	–	–	–	–	–	–	–	285	325	330	335	–	–
LQ	–	–	–	–	–	–	–	–	275	305	315	315	–	–
QR	–	–	–	–	–	–	–	–	010	020	015	020	–	–

* Tabulation of 290 = 2.9 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
S	S	B	D300A	A	A	B	D310R	B	S	–	–	–	–	–	–
B	D310A	D340A	D330A	A	D320R	D310R	D330R	C	C	–	–	–	–	–	–
C	B	B	S	S	S	A	A	A	A	A	–	–	–	–	–
A	A	D310A	S	A	A	A	A	U280R	290*	S	–	–	–	–	–
80A	D300A	B	U340R	B	A	B	A	A	A	–	–	–	–	–	–
A	S	S	A	A	A	A	A	A	A	A	–	–	–	–	–
A	B	B	B	B	B	C	C	A	D270A	–	–	–	–	–	–
A	B	B	S	A	A	A	A	A	A	–	–	–	–	–	–
A	A	A	A	A	A	A	A	A	A	–	–	–	–	–	–
S	B	D320R	330	B	S	A	B	310	S	–	–	–	–	–	–
A	A	B	A	B	D340A	B	B	B	A	–	–	–	–	–	–
B	A	A	A	A	A	A	A	A	A	–	–	–	–	–	–
A	A	B	A	A	A	A	A	A	A	A	–	–	–	–	–
A	A	A	A	A	B	B	A	R	D260R	–	–	–	–	–	–
A	A	A	A	A	A	A	A	A	A	A	–	–	–	–	–
A	D330R	B	S	A	A	A	A	A	A	–	–	–	–	–	–
70A	A	B	S	S	A	A	A	A	A	A	–	–	–	–	–
S	A	A	A	A	A	A	A	A	A	S	–	–	–	–	–
S	B	B	B	B	B	B	B	B	S	S	–	–	–	–	–
A	A	A	B	B	B	B	A	310	A	–	–	–	–	–	–
S	U320B	B	A	S	S	S	S	S	S	S	–	–	–	–	–
90A	310	B	S	A	A	A	A	A	A	–	–	–	–	–	–
S	S	A	C	C	S	S	A	A	A	A	–	–	–	–	–
S	S	A	A	A	A	A	A	A	S	S	–	–	–	–	–
S	S	S	A	S	S	S	S	300	A	–	–	–	–	–	–
S	S	S	S	S	S	S	A	A	A	–	–	–	–	–	–
A	C	C	S	S	A	S	S	A	A	–	–	–	–	–	–
S	S	S	A	S	A	A	A	S	S	–	–	–	–	–	–
S	S	S	S	S	S	S	B	D280R	S	S	–	–	–	–	–
S	S	A	A	A	A	A	A	C	A	–	–	–	–	–	–
S	S	S	S	A	S	S	S	S	S	S	–	–	–	–	–
80	310	320	330	–	330	310	320	300	270	–	–	–	–	–	–
3	5	3	4	–	2	1	2	5	3	–	–	–	–	–	–
85	325	330	335	–	–	–	–	310	280	–	–	–	–	–	–
75	305	315	315	–	–	–	–	280	265	–	–	–	–	–	–
10	020	015	020	–	–	–	–	030	015	–	–	–	–	–	–

B

Characteristic: h'E

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	–	–	–	–	–	–	–	S	S	S	B	110*	A	A
2	–	–	–	–	–	–	–	S	B	120	120	120	A	115
3	–	–	–	–	–	–	–	C	C	B	B	S	S	S
4	–	–	–	–	–	–	–	A	A	A	116	S	A	A
5	–	–	–	–	–	–	–	S	130	120	B	115	B	A
6	–	–	–	–	–	–	–	A	A	S	S	A	A	A
7	–	–	–	–	–	–	–	A	A	B	B	B	B	B
8	–	–	–	–	–	–	–	S	A	B	B	S	A	A
9	–	–	–	–	–	–	–	A	A	A	A	A	A	A
10	–	–	–	–	–	–	–	S	S	B	120	120	B	S
11	–	–	–	–	–	–	–	A	A	A	B	A	B	120
12	–	–	–	–	–	–	–	S	B	A	A	A	A	A
13	–	–	–	–	–	–	–	S	A	A	B	A	A	A
14	–	–	–	–	–	–	–	A	A	A	A	A	A	B
15	–	–	–	–	–	–	–	A	A	A	A	A	A	A
16	–	–	–	–	–	–	–	A	A	120	B	S	A	A
17	–	–	–	–	–	–	–	S	120	A	B	S	S	A
18	–	–	–	–	–	–	–	A	S	120	A	B	A	A
19	–	–	–	–	–	–	–	S	S	B	B	B	B	B
20	–	–	–	–	–	–	–	A	A	A	B	B	B	B
21	–	–	–	–	–	–	–	A	S	B	B	118	S	S
22	–	–	–	–	–	–	–	S	120	120	B	S	A	A
23	–	–	–	–	–	–	–	A	S	S	A	C	C	S
24	–	–	–	–	–	–	–	S	S	S	A	A	A	A
25	–	–	–	–	–	–	–	S	S	S	S	A	S	S
26	–	–	–	–	–	–	–	S	S	S	S	S	S	S
27	–	–	–	–	–	–	–	A	A	C	C	S	S	A
28	–	–	–	–	–	–	–	S	S	S	S	A	S	A
29	–	–	–	–	–	–	–	S	S	S	S	A	S	A
30	–	–	–	–	–	–	–	S	S	S	A	A	A	A
31	–	–	–	–	–	–	–	S	S	S	S	S	A	S
Median	–	–	–	–	–	–	–	–	120	120	120	118	–	118
Count	–	–	–	–	–	–	–	–	3	5	3	5	–	2
UQ	–	–	–	–	–	–	–	–	125	120	120	120	–	–
LQ	–	–	–	–	–	–	–	–	120	120	118	112	–	–
QR	–	–	–	–	–	–	–	–	005	000	002	008	–	–

* Tabulation of 110 = 110 km.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

8	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
S	S	B	110*	A	A	B	120	B	S	–	–	–	–	–	–
B	120	120	120	A	115	110	120	C	C	–	–	–	–	–	–
C	B	B	S	S	S	A	A	A	A	A	–	–	–	–	–
A	A	116	S	A	A	A	A	110	140	S	–	–	–	–	–
30	120	B	115	B	A	B	A	A	A	–	–	–	–	–	–
A	S	S	A	A	A	A	A	A	A	A	–	–	–	–	–
A	B	B	B	B	B	C	C	A	120	–	–	–	–	–	–
A	B	B	S	A	A	A	A	A	A	–	–	–	–	–	–
A	A	A	A	A	A	A	A	A	A	–	–	–	–	–	–
S	B	120	120	B	S	A	B	100	S	–	–	–	–	–	–
A	A	B	A	B	120	B	B	B	A	–	–	–	–	–	–
B	A	A	A	A	A	A	A	A	A	–	–	–	–	–	–
A	A	B	A	A	A	A	A	A	A	A	–	–	–	–	–
A	A	A	A	A	B	B	A	100	120	–	–	–	–	–	–
A	A	A	A	A	A	A	A	A	A	A	–	–	–	–	–
A	120	B	S	A	A	A	A	A	A	–	–	–	–	–	–
20	A	B	S	S	A	A	A	A	A	A	–	–	–	–	–
S	120	A	A	A	A	A	A	A	A	S	–	–	–	–	–
S	B	B	B	B	B	B	B	B	S	S	–	–	–	–	–
A	A	A	B	B	B	B	A	120	A	–	–	–	–	–	–
S	B	B	118	S	S	S	S	S	S	S	–	–	–	–	–
20	120	B	S	A	A	A	A	A	A	–	–	–	–	–	–
S	S	A	C	C	S	S	A	A	A	A	–	–	–	–	–
S	S	A	A	A	A	A	A	A	S	S	–	–	–	–	–
S	S	S	A	S	S	S	S	120	A	–	–	–	–	–	–
A	C	C	S	S	S	S	A	A	A	–	–	–	–	–	–
S	S	S	A	S	A	S	S	A	A	–	–	–	–	–	–
S	S	S	S	S	S	S	A	S	S	–	–	–	–	–	–
S	S	A	A	A	A	A	A	C	A	–	–	–	–	–	–
S	S	S	S	A	S	S	S	S	S	S	–	–	–	–	–
20	120	120	118	–	118	110	120	110	120	–	–	–	–	–	–
3	5	3	5	–	2	1	2	6	3	–	–	–	–	–	–
25	120	120	120	–	–	–	–	120	130	–	–	–	–	–	–
20	120	118	112	–	–	–	–	100	120	–	–	–	–	–	–
05	000	002	008	–	–	–	–	020	010	–	–	–	–	–	–

B

Characteristic: fbEs

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	025*	024	019	020	020	S	S	030	032	044	061M	046	050M
2	A	A	A	M	A	A	S	028	031	035	038	038	038M	G
3	C	C	C	C	C	C	C	C	C	A	A	A	M	M
4	S	S	-	A	A	A	028M	026	040M	045M	040	039M	A	A
5	S	E	018	014	015	A	-	027	031	034	037	G	B	037
6	S	S	S	013	A	A	026	027	033	033	040	039M	039M	042
7	S	B	B	B	-	018M	030	A	031M	043	043	050M	050	047
8	S	S	S	S	B	B	030	S	031	045	044	S	040	039
9	B	016	020	A	A	A	025M	-	030M	035	038M	050M	047	A
10	S	-	S	E	E	B	S	028	031	B	G	G	B	042
11	S	-	S	014	015	A	024	026	032	040	B	039M	049	042
12	032M	023	M	A	A	019M	A	032M	034M	046	044M	038M	A	A
13	S	S	E	B	-	B	S	030	031	035	B	038M	041M	A
14	B	A	A	A	A	A	030	032	041M	A	035	048M	041M	B
15	B	S	A	A	A	A	029	029	046M	037	A	041	045M	A
16	S	S	A	B	B	B	S	027	030	G	B	050	A	A
17	C	S	-	B	014M	B	S	S	030	037	038	040	040M	A
18	S	S	S	-	016	A	023	027	030	035	039	044M	036	036
19	A	M	A	B	A	B	S	028	038M	050M	B	B	B	B
20	S	016	017	A	A	A	A	A	047M	037	036	B	B	B
21	023	S	022M	M	A	A	023	034M	M	B	B	038	038M	041M
22	-	023M	017M	A	A	A	S	027	031	G	047M	044M	M	045M
23	A	A	A	A	A	B	024M	031M	036M	037M	044M	C	C	045M
24	S	S	S	S	E	S	S	S	030M	034M	054M	046M	043	045M
25	S	S	014	016M	M	A	M	035M	050M	035	040M	037M	045	041
26	S	016	S	S	M	A	S	026	031	034M	038M	039	040M	036
27	S	-	-	-	-	S	-	030	040	C	C	042M	039	038
28	B	-	M	S	A	A	M	025M	030	033	045M	045	050M	044M
29	S	-	S	M	016M	018M	029	028	030M	034	S	037	037	S
30	B	-	017	016	-	M	024	027	032	040	A	A	A	A
31	S	S	S	-	-	-	024	030	035	038	036	039M	046	040
Median	-	019	017	015	016	019	026	028	031	036	040	040	041	042
Count	2	6	8	6	6	4	14	23	29	24	20	23	20	17
UQ	-	023	021	016	019	020	029	030	037	040	044	046	046	045
LQ	-	016	017	014	015	018	024	027	030	034	038	038	039	039
QR	-	007	004	002	004	002	005	003	007	006	006	008	007	006

* Tabulation of 025 = 2.5 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
030	032	044	061M	046	050M	040	G	036M	030	034M	045M	021	-	024	021
031	035	038	038	038M	G	G	G	C	C	C	C	C	C	C	C
C	A	A	A	M	M	045M	040	047	050	030	034	025	B	S	S
040M	045M	040	039M	A	A	046	036	G	G	S	S	S	S	S	S
031	034	037	G	B	037	037M	040M	070M	A	060	025	S	S	-	024
033	033	040	039M	039M	042	042M	038M	040M	034M	033	028	030	027	S	B
031M	043	043	050M	050	047	C	C	044	035	026	023	-	S	S	S
031	045	044	S	040	039	041	036M	032	030	032	027	S	S	023	S
030M	035	038M	050M	047	A	055M	045	A	033	037	027	S	S	S	S
031	B	G	G	B	042	038	B	G	S	S	S	S	023	S	S
032	040	B	039M	049	042	B	037	035	030M	S	D023R	S	S	-	S
034M	046	044M	038M	A	A	054M	A	041M	039M	042M	049	035	-	S	S
031	035	B	038M	041M	A	044M	064M	068	069M	A	070M	036	023	B	-
041M	A	035	048M	041M	B	B	034	G	G	S	S	S	028	030	A
046M	037	A	041	045M	A	040	036	033	030	-	026	022	025	025	S
030	G	B	050	A	A	A	059M	067M	A	047	035	028	024	C	C
030	037	038	040	040M	A	040M	036M	044M	034M	034M	033	023	S	S	S
030	035	039	044M	036	036	039	038	038	032M	026	043M	S	S	M	S
038M	050M	B	B	B	B	037	039	B	S	S	-	-	S	S	S
047M	037	036	B	B	B	B	036	G	032M	060	055	023	S	S	S
M	B	B	038	038M	041M	037M	045M	044M	028M	S	025	S	S	S	-
031	G	047M	044M	M	045M	A	044M	040M	032	030M	035M	040	026	026	A
036M	037M	044M	C	C	045M	044	045M	034	031	043M	-	-	-	023	-
030M	034M	054M	046M	043	045M	034	033M	031M	S	S	031M	M	M	029M	-
050M	035	040M	037M	045	041	044M	038	027	040	030	028M	027	031	028	-
031	034M	038M	039	040M	036	044	060M	052M	040M	034	026	026	034	-	-
040	C	C	042M	039	038	040	035	043M	030	031	053M	040M	-	A	S
030	033	045M	045	050M	044M	053M	038M	032M	R	025M	027	B	-	-	S
030M	034	S	037	037	S	037	D032R	G	S	023	025	S	S	S	S
032	040	A	A	A	A	A	A	C	049	038	034	030	028	-	S
035	038	036	039M	046	040	040	036M	037M	030M	027	-	-	S	S	S
031	036	040	040	041	042	040	038	040	032	033	030	028	027	025	-
29	24	20	23	20	17	23	25	22	21	21	24	14	10	8	2
037	040	044	046	046	045	044	045	044	040	040	039	035	028	029	-
030	034	038	038	039	039	038	036	033	030	029	026	023	024	023	-
007	006	006	008	007	006	006	009	011	010	011	013	012	004	006	-

B

Characteristic: foEs

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	027*	032	031	025	032	034	S	S	032	032	044	090M	070	075M
2	068M	100M	055M	050M	031	035	S	034	034	036	038	038	050M	G
3	C	C	C	C	C	C	C	C	C	100M	100M	100M	100M	110M
4	S	S	022	050M	084M	047	059M	045	065M	065M	045	049M	057M	090M
5	S	E	020	020	018	021	026	027	032	037	037	G	B	045
6	S	S	S	015	032	022	032	041	044	039	040	055M	055M	046
7	S	B	B	B	021	047M	050	059M	070M	043	046	063M	056	055
8	S	S	S	S	B	B	036	S	033	045	049	S	040	039
9	B	020	026	030M	036M	070M	045M	030	046M	057	070M	080M	056	082M
10	S	021	S	E	E	B	S	028	031	B	G	G	B	045
11	S	019	S	016	030	045M	027	032	038	040	B	060M	059	042
12	077M	032	100M	080M	100M	080M	100M	048M	074M	100	054M	095M	124M	130M
13	S	S	E	B	019	B	S	031	036	035	B	050M	070M	106M
14	B	037	050	041	042	039	037	041	068M	080M	039	065M	085M	B
15	B	S	044M	021	026	020	048	032	080M	054	052	050	085M	075M
16	S	S	021	B	B	B	S	032	035	G	B	058	072M	105M
17	C	S	021	B	024M	B	S	S	030	037	038	047	100M	110M
18	S	S	S	021	019	031M	031	032	035	037	054	065M	040	041
19	055M	045M	055M	B	017	B	S	028	049M	061M	B	B	B	B
20	S	022	033	077	055	052M	077M	081M	070M	046	041	B	B	B
21	022	S	037M	049M	051M	025	025	055M	039M	B	B	038	092M	055M
22	030	036M	057M	047M	021	031	S	033	031	G	071M	080M	104M	075M
23	023	022	021	024	016	B	043M	060M	065M	057M	065M	C	C	065M
24	S	S	S	S	E	S	S	S	047M	048M	082M	090M	055	084M
25	S	S	026	036M	050M	044M	070M	065M	060M	035	054M	070M	053	053
26	S	032	S	S	035M	057	S	026	037	041M	048M	048	085M	047
27	S	024	017	024	024	S	025	048	058	C	C	090M	048	047
28	B	037	035M	S	025	041M	048M	045M	036	042	061M	051	080M	080M
29	S	020	S	050M	045M	042M	049	034	045M	040	S	037	037	S
30	B	027	027	025	016	055M	032	027	042	048	140M	120M	106M	098M
31	S	S	S	026	020	021	035	043	047	047	045	070M	075	057
Median	030	030	031	028	028	041	040	034	043	044	049	063	070	070
Count	7	16	19	20	26	21	20	26	30	26	23	25	26	26
UQ	068	036	050	050	042	049	049	048	060	057	065	085	085	090
LQ	023	022	021	023	020	028	032	031	035	037	041	050	055	047
QR	045	014	029	027	022	021	017	017	025	020	024	035	030	043

* Tabulation of 027 = 2.7 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

July 1965

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
032	044	090M	070	075M	040	G	046M	030	070M	070M	040	030	034	038
036	038	038	050M	G	G	G	C	C	C	C	C	C	C	C
100M	100M	100M	100M	110M	055M	050	057	065	038	041	032	B	S	S
065M	045	049M	057M	090M	053	038	G	G	S	S	S	S	S	S
037	037	G	B	045	048M	078M	085M	092M	060	030	S	S	030	040
039	040	055M	055M	046	075M	058M	055M	052M	042	030	030	027	S	B
043	046	063M	056	055	C	C	050	046	030	030	027	S	S	S
045	049	S	040	039	050	052M	040	038	047	037	S	S	036	S
057	070M	080M	056	082M	080M	050	070M	040	046	031	S	S	S	S
B	G	G	B	045	038	B	G	S	S	S	S	023	S	S
040	B	060M	059	042	B	037	033	055M	S	D023R	S	S	035	S
100	054M	095M	124M	130M	090M	103M	075M	055M	062M	049	041	028	S	S
035	B	050M	070M	106M	075M	080M	068	095M	106M	100M	045	030	B	036
080M	039	065M	085M	B	B	034	G	G	S	S	S	028	030	A
054	052	050	085M	075M	055	042	045	046	039	033	030	034	030	S
G	B	058	072M	105M	095M	080M	104M	070	047	045	028	033	C	C
037	038	047	100M	110M	077M	059M	063M	050M	057M	038	030	S	S	S
037	054	065M	040	041	043	040	038	044M	026	073M	S	S	044M	S
061M	B	B	B	B	037	039	B	S	S	025	029	S	S	S
046	041	B	B	B	B	045	G	055M	060	067	030	S	S	S
B	B	038	092M	055M	057M	098M	075M	047M	S	030	S	S	S	C27
G	071M	080M	104M	075M	075	075M	075M	046	060M	046M	043	030	030	030
057M	065M	C	C	065M	050	090M	043	048	057M	042	034	027	027	027
048M	082M	090M	055	084M	046	049M	055M	S	S	C47M	046M	037M	070M	025
035	054M	070M	053	053	070M	048	035	056	046	043M	036	034	028	028
041M	048M	048	085M	047	057	102M	104M	067M	048	036	031	036	035	026
C	C	090M	048	047	046	050	060M	035	031	085M	050M	043	042	S
042	061M	051	080M	080M	100M	061M	053M	D026R	048M	030	B	026	023	S
040	S	037	037	S	040	D032R	G	S	023	025	S	S	S	S
048	140M	120M	106M	098M	090	081	C	070	058	067	041	034	026	S
047	045	070M	075	057	045	074M	067M	052M	033	025	020	S	S	S
044	049	063	070	070	055	052	057	051	047	038	032	030	030	028
26	23	25	26	26	26	27	23	24	23	27	19	16	15	9
057	065	085	085	090	075	080	075	060	060	049	041	034	036	037
037	041	050	055	047	046	042	045	045	038	030	030	028	028	027
020	024	035	030	043	029	038	030	015	022	019	011	006	008	010

B

Characteristic: h'Es

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	105*	100	100	100	100	100	S	S	120	120	105	100	100	100	14
2	120	115	115	110	110	100	S	120	130	130	130	125	100	G	G
3	C	C	C	C	C	C	C	C	C	110	105	105	100	100	10
4	S	S	110	110	110	110	110	110	110	110	120	115	110	105	10
5	S	E	110	110	110	130	130	140	140	140	135	G	B	115	11
6	S	S	S	110	110	110	105	100	105	110	120	100	100	100	10
7	S	B	B	B	125	118	110	115	110	150	140	130	130	120	C
8	S	S	S	S	B	B	112	S	120	118	130	S	100	100	11
9	B	100	100	120	110	110	110	118	110	110	110	100	100	100	10
10	S	120	S	E	E	B	S	140	140	B	G	G	B	100	11
11	S	120	S	120	120	110	120	130	120	120	B	100	130	130	B
12	128	120	120	120	120	120	110	118	120	120	110	110	105	105	105
13	S	S	E	B	120	B	S	130	120	110	B	110	105	110	110
14	B	100	100	100	100	100	100	100	100	100	100	100	100	B	B
15	B	S	100	110	110	100	100	100	100	100	100	100	100	100	100
16	S	S	100	B	B	B	S	120	120	G	B	110	105	105	105
17	C	S	120	B	120	B	S	S	120	110	110	110	110	100	100
18	S	S	S	100	100	115	115	120	120	115	110	105	115	110	105
19	110	125	120	B	110	B	S	130	125	110	B	B	B	B	140
20	S	110	125	120	120	120	115	120	110	110	110	B	B	B	B
21	110	S	120	115	120	115	112	110	130	B	B	120	130	100	100
22	100	130	120	120	120	120	S	125	150	G	100	100	100	105	105
23	105	100	100	100	100	B	120	120	115	110	110	C	C	105	110
24	S	S	S	S	E	S	S	S	110	110	105	100	105	100	100
25	S	S	120	120	115	110	110	112	115	140	115	110	105	100	100
26	S	100	S	S	110	106	S	120	115	110	110	110	105	100	105
27	S	120	120	120	120	S	110	110	110	C	C	105	105	105	110
28	B	100	-	S	110	110	120	120	120	110	106	105	110	110	100
29	S	120	S	120	110	110	110	120	110	110	S	100	100	S	110
30	B	100	100	100	100	115	115	120	110	105	105	100	100	100	100
31	S	S	S	100	110	110	110	110	105	110	105	100	100	100	100
Median	110	112	112	110	110	110	110	120	118	110	110	105	105	100	105
Count	7	16	18	20	26	21	20	26	30	26	23	25	26	26	26
UQ	120	120	120	120	120	116	115	120	120	120	120	110	110	105	110
LQ	105	100	100	100	110	108	110	110	110	110	105	100	100	100	100
QR	015	020	020	020	010	008	005	010	010	010	015	010	010	005	010

* Tabulation of 105 = 105 km.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

July 1965

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
120	105	100	100	100	140	G	110	115	110	110	110	120	120	125
130	130	125	100	G	G	G	C	C	C	C	C	C	C	C
110	105	105	100	100	100	100	100	100	100	100	100	B	S	S
110	120	115	110	105	103	100	G	G	S	S	S	S	S	S
140	135	G	B	115	110	110	100	100	100	100	S	S	130	120
110	120	100	100	100	100	100	100	100	100	100	100	100	S	B
150	140	130	130	120	C	C	115	112	100	100	100	S	S	S
118	130	S	100	100	110	110	100	105	100	100	S	S	130	S
110	110	100	100	100	100	100	100	100	100	100	S	S	S	S
B	G	G	B	100	110	B	G	S	S	S	S	130	S	S
120	B	100	130	130	B	130	110	100	S	100	S	S	130	S
120	110	110	105	105	105	100	100	100	100	100	100	110	S	S
110	B	110	105	110	110	108	100	100	100	100	090	090	B	100
100	100	100	100	B	B	100	G	G	S	S	S	100	095	090
100	100	100	100	100	100	100	105	100	105	110	100	100	100	S
G	B	110	105	105	105	105	100	100	100	100	100	100	C	C
110	110	110	110	100	100	110	100	100	100	100	100	S	S	S
115	110	105	115	110	105	110	100	100	120	100	S	S	110	S
110	B	B	B	B	140	160	B	S	S	135	130	S	S	S
110	110	B	B	B	B	100	G	100	100	100	110	S	S	S
B	B	120	130	100	100	100	100	100	S	100	S	S	S	130
G	100	100	100	105	105	100	100	100	100	100	100	110	100	105
110	110	C	C	105	110	105	100	100	100	100	100	100	100	100
110	105	100	105	100	100	110	100	S	S	125	120	120	115	110
140	115	110	105	100	100	105	110	100	100	105	100	100	110	110
110	110	110	105	100	105	105	106	105	105	100	100	102	100	105
C	C	105	105	105	110	100	100	100	100	115	100	105	107	S
110	106	105	110	110	100	105	100	115	U100S	100	B	100	100	S
110	S	100	100	S	110	110	G	S	110	100	S	S	S	S
105	105	100	100	100	100	100	C	100	100	100	100	100	100	S
110	105	100	100	100	100	100	100	100	100	100	100	S	S	S
110	110	105	105	100	105	105	100	100	100	100	100	100	107	107
26	23	25	26	26	26	27	23	24	23	27	19	16	15	10
120	120	110	110	105	110	110	105	100	100	100	100	110	120	120
110	105	100	100	100	100	100	100	100	100	100	100	100	100	100
010	015	010	010	005	010	010	005	000	000	000	000	010	020	020

B

Characteristic: Type of Es

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
July 1965

Observed at:
Bangkok, Thailand
Lat. 13.73° N, Long. 100.57° E
105° E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	f2	f4	f5	f2	f3	f2	-	-	c	c	c	c4	ℓ3	ℓ2
2	f3	f5	f2	f2	f3	f2	-	c	c	c	c	c	ℓ	-
3	-	-	-	-	-	-	-	-	-	c4	c3	c5	c3	c4
4	-	-	f2	f4	f5	f5	f5	ℓ	ℓ3	ℓ2	c	c2	c2	ℓ3
5	-	-	f	f2	f	f	f	c	c	c	c	-	-	ℓ
6	-	-	-	f2	f2	f2	f2	ℓ2	ℓ2	c	cℓ	ℓ	ℓ	ℓ2
7	-	-	-	-	f	f3	f4	ℓ6	ℓ2	c	c	c	c	c
8	-	-	-	-	-	-	f2	-	ℓ	c	c	-	ℓ	ℓ
9	-	f	f	f	f4	f3	f2	ℓ	ℓ	ℓ	ℓ	ℓ3	ℓ3	ℓ3
10	-	f	-	-	-	-	-	c	c	-	-	-	-	c2
11	-	f	-	f2	f5	f4	f	ℓ	ℓ	ℓc	-	ℓ	c	c
12	f2	f	f2	f3	f6	f3	f4	c	c	ℓ2	ℓ	ℓ2	ℓ4	ℓ4
13	-	-	-	-	f2	-	-	c	ℓ	ℓc	-	ℓ	ℓ2	ℓ3
14	-	f3	f2	f2	f5	f5	f4	ℓ3	ℓ3	ℓ	ℓ	ℓ2	ℓ2	-
15	-	-	f2	f	f2	f	f4	ℓ2	ℓ4	ℓ	ℓ	ℓ	ℓ2	ℓ2
16	-	-	f	-	-	-	-	ℓ	ℓ	-	-	c2	c2	ℓ3
17	-	-	f	-	f	-	-	-	c	ℓ	c	c	c2	ℓ4
18	-	-	-	f	f2	f	f	ℓ	ℓ	c	ℓ	ℓ2	ℓ	ℓ
19	f3	f2	f3	-	f	-	-	c	c	c2	-	-	-	-
20	-	f	f2	f5	f2	f5	f4	ℓ4	ℓ2	ℓ	ℓ	-	-	-
21	f	-	f2	f2	f4	f	f	ℓ3	fc	-	-	c	ℓ2	c
22	f	f	f2	f2	f2	f4	-	c	c	-	c	ℓ2	ℓ3	ℓ3
23	f	f2	f2	f2	f	-	f	ℓ2	c2	c2	ℓ	ℓ2	ℓ	ℓ2
24	-	-	-	-	-	-	-	-	c2	c	ℓ3	ℓ3	ℓ3	ℓ3
25	-	-	f2	f2	f2	f3	f5	c2	c2	cℓ	c	ℓ	c2	c2
26	-	f2	-	-	f	f5	-	c	ℓc	c	c	ℓ	c2	ℓ
27	-	f	f	f	f	-	f	ℓ3	ℓ3	-	-	ℓ3	c2	ℓ2
28	-	f	f	-	f2	f8	f	ℓ	ℓc	ℓ	c2	ℓ3	c3	ℓ2
29	-	f	-	f2	f2	f3	f3	ℓ	ℓ	ℓ	-	c	c	-
30	-	f2	f2	f2	f	f2	f	c	ℓ	ℓ2	ℓ3	ℓ4	ℓ3	ℓ3
31	-	-	-	f	f	f2	f2	ℓ2	ℓ2	ℓ2	ℓ	ℓ	ℓ3	ℓ2
Median	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-	-	-

A

IONOSPHERIC DATA
1 Mc to 25 Mc in 0.5 minute
July 1965

9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
c	c	c4	ℓ3	ℓ2	c	–	c2	c	f4	f6	f3	f3	f	f2
c	c	c	ℓ	–	–	–	–	–	–	–	–	–	–	–
4	c3	c5	c3	c4	ℓ2	ℓ2	ℓ3	ℓ4	ℓ4	f5	f2	–	–	–
2	c	c2	c2	ℓ3	ℓ2	ℓ	–	–	–	–	–	–	–	–
c	c	–	–	ℓ	c	ℓ2	ℓ4	ℓ5	f8	f	–	–	f	f2
c	cℓ	ℓ	ℓ	ℓ2	ℓ3	ℓ3	ℓ2	ℓ3	ℓ3	f2	f2	f2	–	–
c	c	c	c	c	–	–	cℓ	c	f3	f2	f	-	–	–
c	c	–	ℓ	ℓ	ℓ	ℓ	ℓ	ℓ2	f5	f6	–	–	f2	–
ℓ	ℓ	ℓ3	ℓ3	ℓ3	ℓ2	ℓ3	ℓ2	ℓ2	f2	f2	–	–	–	–
-	–	–	–	c2	ℓ	–	–	–	–	–	–	f	–	–
c	–	ℓ	c	c	–	c	c	ℓ2	–	f	–	–	f	–
2	ℓ	ℓ2	ℓ4	ℓ4	ℓ2	ℓ4	ℓ2	ℓ2	ℓ4	f6	f3	f	–	–
c	–	ℓ	ℓ2	ℓ3	ℓ2	ℓ3	ℓ3	ℓ5	ℓ6	f4	f5	f	–	f
ℓ	ℓ	ℓ2	ℓ2	–	–	ℓ	–	–	–	–	–	f	f2	–
ℓ	ℓ	ℓ	ℓ2	ℓ2	ℓ	ℓ	ℓ2	ℓ2	ℓ	f2	f2	f2	f2	–
-	–	c2	c2	ℓ3	ℓ2	ℓ3	ℓ4	ℓ4	f7	f4	f	f2	–	–
ℓ	c	c	c2	ℓ4	ℓ2	ℓ	ℓ4	ℓ3	ℓ3	f3	f2	–	–	–
3	ℓ	ℓ2	ℓ	ℓ	ℓ	ℓ2	ℓ	ℓc	c	f3	–	–	f	–
2	–	–	–	–	c	c	–	–	–	f	f	–	–	–
ℓ	ℓ	–	–	–	–	ℓ	–	ℓ5c	ℓ7	ℓ6	f2	–	–	–
-	–	c	ℓ2	c	ℓ2	ℓ3	ℓ4	ℓc	–	f2	–	–	–	f
-	c	ℓ2	ℓ3	ℓ3	ℓ2	ℓ3	ℓ3	ℓ3	ℓ3	f2	f	f	f	f
2	ℓ	ℓ2	ℓ	ℓ2	ℓ3	ℓ3	ℓ2	ℓ4	ℓ6	f5	f2	f3	f2	f
2	ℓ3	ℓ3	ℓ3	ℓ3	ℓ	ℓ	ℓ	–	–	f3	f	f	f3	f
ℓ	c	ℓ	c2	c2	c	c2	ℓ	ℓ5	ℓ2	f3	f3	f3	f2	f
c	c	ℓ	c2	ℓ	ℓ3	ℓ4	ℓ5	ℓ4	f3	f2	f2	f3	f2	f
-	–	ℓ3	c2	ℓ2	ℓ	ℓ2	ℓ2c	ℓ2	f	f3	f	f	f3	–
ℓ	c2	ℓ3	c3	ℓ2	ℓ4	ℓ2	ℓ	c	ℓc	f2	–	f2	f	–
ℓ	–	c	c	–	ℓ	c	–	–	c	f	–	–	–	–
2	ℓ3	ℓ4	ℓ3	ℓ3	ℓ2	ℓ3	–	ℓ5	f5	f3	f2	f	f	–
3	ℓ	ℓ	ℓ3	ℓ2	ℓ2	ℓ2	ℓ4	ℓ2	ℓ3	f	f	–	–	–
-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
-	–	–	–	–	–	–	–	–	–	–	–	–	–	–

B

MEDIAN VALUES JULY 1965

Hour Local	fmin (Mc)	foF2 (Mc)	M(3000)F2	h'F2 (km)	h'F (km)	foF1 (Mc)	M(3000)F1	foE (Mc)	h'E (km)	fbEs (Mc)	foEs (Mc)	h'Es (km)
00	2.0	3.9	2.95	-	310	-	-	-	-	-	3.0	110
01	1.6	3.2	3.15	-	300	-	-	-	-	1.9	3.0	112
02	1.4	2.9	3.23	-	275	-	-	-	-	1.7	3.1	112
03	1.6	2.5	3.30	-	285	-	-	-	-	1.5	2.8	110
04	1.4	2.1	3.30	-	260	-	-	-	-	1.6	2.8	110
05	1.6	2.2	3.50	-	267	-	-	-	-	1.9	4.1	110
06	2.0	3.3	3.30	-	285	-	-	-	-	2.6	4.0	110
07	2.3	5.6	3.20	270	240	-	-	-	-	2.8	3.4	120
08	2.4	6.5	3.08	318	220	4.1	3.55	2.8	120	3.1	4.3	118
09	2.7	6.9	2.75	365	210	4.2	3.80	3.1	120	3.6	4.4	110
10	3.1	6.7	2.55	405	200	4.4	4.00	3.2	120	4.0	4.9	110
11	3.0	6.4	2.37	445	200	4.4	4.10	3.3	118	4.0	6.3	105
12	3.0	6.5	2.40	455	200	4.5	4.15	-	-	4.1	7.0	105
13	3.0	6.4	2.38	450	200	4.4	4.10	3.3*	118*	4.2	7.0	100
14	3.0	6.5	2.45	425	200	4.4	4.05	3.1*	110*	4.0	5.5	105
15	2.7	6.9	2.45	402	200	4.3	4.00	3.2*	120*	3.8	5.2	105
16	2.4	7.0	2.57	380	205	4.2	3.80	3.0	110	4.0	5.7	100
17	2.3	7.3	2.65	330	230	3.8	3.70	-	120	3.2	5.1	100
18	2.0	7.8	2.85	300	260	-	-	-	-	3.3	4.7	100
19	2.0	8.0	3.18	-	250	-	-	-	-	3.0	3.8	100
20	2.0	7.0	3.20	-	250	-	-	-	-	2.8	3.2	100
21	2.2	5.7	3.20	-	260	-	-	-	-	2.7	3.0	100
22	2.1	4.8	3.20	-	275	-	-	-	-	2.5	3.0	107
23	2.0	4.1	3.00	-	300	-	-	-	-	-	2.8	107

* Insufficient data for reliable median.

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS
BANGKOK, THAILAND
JULY 1965

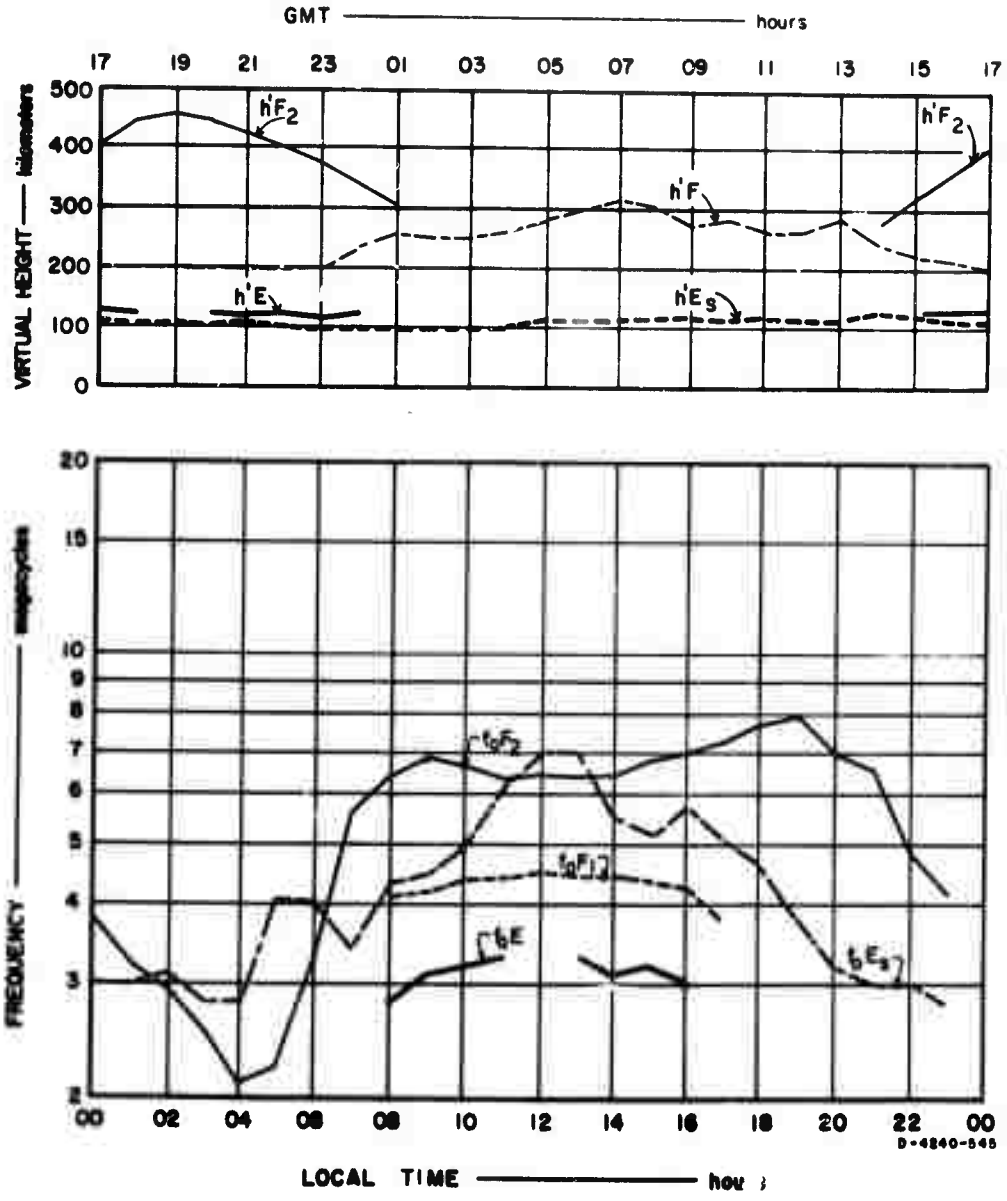

FIG. 1 SUMMARY GRAPHS

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